

## CLIP AND METHOD OF MANUFACTURING THEREOF

### CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims the benefit of United States Provisional Patent Application No. 60/408,632, filed September 6, 2002, which is hereby incorporated by reference in its entirety.

### BACKGROUND OF THE INVENTION

#### Field of the Invention

**[0002]** The present invention relates to a clip and a method for making a clip, more particularly a clip for use with sound-absorbing media used with roof decks.

#### Description of Related Art

**[0003]** Typically, acoustical roof decks include a profiled member having a perforated flat portion with sound-absorbing media received within a cavity. The sound-absorbing media is spaced a distance from the perforated members. Various types of spacers have been used in the sound-absorbing media to provide such a function. One such example is the use of clips that slide on ends of the sound-absorbing media as can be seen in Figs. 1A and 1B. However, problems exist with these prior art clips, as they must be sized based upon the thickness of the sound-absorbing media for individual applications. These clips prove to be inefficient as well as costly. Further, during installation, these clips have a tendency to fall off the sound-absorbing media.

**[0004]** Therefore, it is an object of the present invention to provide an apparatus and method for efficiently making a sized clip for universal uses and having improvements to overcome the deficiencies of the prior art.

### SUMMARY OF THE INVENTION

**[0005]** The present invention is a clip that includes a body, a step portion and a first prong member. The body includes a first side and a second side. The first prong member projects

outward from the first side of the body. The first prong member extends in a first direction from the body and the step portion extends in a second direction from the body. The first prong member has a pointed end and at least one barb along a length of the first prong member. The step portion includes about a 0.25 inch - 0.50 inch step radius. The clip may be made of a metal or polymeric material.

**[0006]** The clip may further include a second prong member projecting outward from the second side of the body. The first and second prong members are bent transverse to the body in a first direction and the step portion is transverse to the body in a second direction. The body may further include a flat portion having a second prong member with the first and second prong members extending from opposite sides of the body, and the step portion located therebetween on the flat portion of the body.

**[0007]** The present invention is also directed to a method of making a clip for use with sound-absorbing media. The steps include providing a flat blank having a first side and a second side. The blank is stamped to include a unitary body and at least one prong member, wherein the at least one prong member is located at the first side of the blank. The blank is then formed to include a step portion and the at least one prong member is bent.

**[0008]** A second prong member may be located at the second side of the blank. The first and second prong members may include a pointed end and at least one barb along a length of the prong member. The method may further include the step of bending the first and second prong member transverse to the body in a first direction with the step portion transverse to the body in a second direction. The at least one prong member extends in a first direction and the step portion extends in a second direction.

**[0009]** The present invention is also directed to a roof deck. The roof deck includes a structural panel, a sound-absorbing media, and a plurality of clips. The structural panel includes a bottom member, an upper member and a receiving cavity therebetween. The

bottom member of the structural panel may be perforated. The sound-absorbing media may be fiberglass or the like. The clip includes a body having a first side and a second side, a step portion, and a first prong member projecting outward from the first side of the body. At least one clip is inserted into the sound-absorbing media which is placed into the receiving cavity of the structural panel. The clip further includes a second prong member projecting outward from the second side of the body. The first prong member extends in a first direction and the step portion extends in a second direction. The first prong member has a pointed end and at least one barb along a length of the first prong member. The shelf portion has about a 0.25 inch - 0.50 inch step radius.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Fig. 1A is a perspective view showing a prior art roof deck arrangement utilizing a prior art clip;

[0011] Fig. 1B is a side elevational view showing the prior art clip shown in Fig. 1A;

[0012] Fig. 2A is a top plan view of a blank used for making a clip in accordance with the present invention;

[0013] Fig. 2B is a side perspective view of a clip in accordance with the present invention;

[0014] Fig. 2C is a side elevational view, partially in section, taken along lines 2C-2C in Fig. 2B;

[0015] Fig. 2D is a bottom plan view of the clip shown in Fig. 2B;

[0016] Fig. 3 is a perspective view of a roof deck in accordance with the present invention; and

[0017] Fig. 4 shows a top perspective view of sound-absorbing media having a plurality of clips made in accordance with the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

[0018] Figs. 1A and 1B illustrate a prior art clip 1 that fits on an end of sound-absorbing media 2 received within a structural panel 3. The panel 3 includes a bottom perforated member 4 and an upper profiled member 5 defining a sound-absorbing media receiving cavity 6. The clip 1 slides over an end 7 of the sound-absorbing media 2 and has a step 8 that raises the sound-absorbing media 2 off the perforated member 4.

[0019] Figs. 2A-2D illustrate a clip 10 made in accordance with the present invention. Referring specifically to Figs. 2B-2D, the clip 10 includes a body 12 having a step portion or bubble 14 depending therefrom and prong members 16 and 17. As can be seen, the clip 10 has at least one prong member, but preferably has two prong members.

[0020] The body 12 is preferably made from a flat blank 20, as illustrated in Fig. 2A and will be described in more detail hereinafter. The body 12 may be of any flexible rigid material. Preferably the body 12 is made of a metal such as steel, copper, aluminum or the like such that it can be formed via a tool to produce the clip 10. Additionally, the clip 10 may be of other material such as molded from plastic, or the like.

[0021] The body 12 has a first side 22 and a second side 24. The first side 22 and the second side 24 are on opposing ends or sides of the body 12. The first prong member 16 is located at the first side 22 of the body 12 and the second prong member 17 is located at the second side 24 of the body 12. The step portion 14 of the body 12 is located therebetween the first side 22 and the second side 24 of the body 12.

[0022] The prong members 16, 17 depend from the body 12 and each include a first end 26, 26' and an opposing end 28, 28'. The first ends 26, 26' of the prong members 16, 17 are located at the first side 22 of the body 12 and the second side 24 of the body 12, respectively. The opposing ends 28, 28' of the prong members 16, 17 are located opposite the first ends 26, 26' of the prong members 16, 17. The opposing ends 28, 28' of the prong members 16, 17

include pointed ends 30, 30'. The pointed ends 30, 30' allow for penetration of the prong members 16, 17 through the sound-absorbing media 2.

[0023] At least one barb 32, 32' is located along the length of the prong members 16, 17. Preferably, a plurality of barbs 32, 32', for example three barbs 32, 32' as illustrated in Fig. 2C, are located along the length of the prong members 16, 17. The barbs 32, 32' aid to maintain the clip 10 in the sound-absorbing media 2 as will be discussed in detail hereinafter. The prong members 16, 17 extend or project outward in a first direction x from the body 12. The step portion 14 of the body 12 extends in a second or opposing direction y from the prong members 16, 17.

[0024] The step portion 14 is adapted to rest on the bottom perforated member 4 of the panel 3 to raise the sound-absorbing media 2 from the panel 3. The prong members 16, 17 are adapted to engage with the sound-absorbing media 2. The depth of the step portion 14 may vary. For example, Fig. 2B illustrates a clip 10 having about a 0.25 inch step radius r. The radius r may vary in size and is preferably about 0.25 inch - 0.50 inch. The step portion 14 may also take other shapes such as rectangular or triangular.

[0025] The present invention is also directed to a method of making a clip for use with sound-absorbing media. The steps include providing a flat blank 20 having a first side 22 and a second side 24. The blank 20 is stamped to include a unitary body 12 and at least one prong member 16, wherein the at least one prong member 16 is located at the first side 22 of the blank 20. The blank 20 is then formed to include a step portion 14 and then the at least one prong member 16 is bent.

[0026] A second prong member 17 may be located at the second side 24 of the blank 20. The method may further include the step of bending the first and second prong members 16, 17 transverse to the body 12 in a first direction x while the step portion 14 is transverse to the

body 12 in a second direction y. The prong members 16, 17 include pointed ends 30, 30' along with the barbs 32, 32' located along a length of the prong members 16, 17.

**[0027]** The present invention is also directed to a roof deck 38 as illustrated in Fig. 3. The roof deck 38 includes a structural panel 3, a sound-absorbing media 2, and a plurality of clips 10. The structural panel 3 includes a bottom member 4, an upper member 5 and a receiving cavity 6 therebetween. The bottom member 4 of the structural panel 3 is perforated. The sound-absorbing media 2 is fiberglass or the like. A plurality of clips 10, as previously described are inserted into the sound-absorbing media 2 which is placed into the receiving cavity 6 of the structural panel 3.

**[0028]** In further detail, Fig. 4 illustrates the sound-absorbing media 2 having four clips 10. As shown, the prong members 16, 17 of each of the clips 10 are inserted into the sound-absorbing media 2 until the body 12 rests against a surface S of the sound-absorbing media 2. The step portion 14 of the clips 10 extend from the surface S in an opposing direction from the prong members 16, 17 and when resting on a supporting member, such as the perforated member 4, support the sound-absorbing media therefrom.

**[0029]** The clips 10 may vary in orientation. For example, the clips 10 may be inserted into the sound-absorbing media 2 horizontally as shown in Fig. 3 or longitudinally as in Fig. 4. Also, the clips 10 may be placed in the sound-absorbing media 2 in any configuration effective to space or raise the sound-absorbing media 2 from the perforated member 4. For example, the clips 10 may be placed incrementally along the sound-absorbing media 2. The barbs 32, 32' along the prong members 16, 17 interact with the sound-absorbing media 2 preventing the clip 10 from being easily removed or pulling out therefrom, especially if the sound-absorbing media 2 is made of a fiberglass type of fibrous insulation or rock wool. The clipped sound-absorbing media 2 can then be inserted within the sound-absorbing media receiving cavity 6 so that the sound-absorbing media 2 is spaced from or raised from the

perforated member 4. Therefore the clips 10 may be used universally in a variety of applications without the need for resizing.

**[0030]** The clips 10 of the present invention overcome the problems of the prior art spacer clips in that they are held in place by the barbs as opposed to being slidably received upon the ends of the sound-absorbing media 2.

**[0031]** While a specific embodiment of the invention has been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. The presently preferred embodiment described herein is meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the appended claims and any and all equivalents thereof.